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Abstract

This article responds to Jean Tirole, winner of the Nobel prize for economics in 2014 and the signatories of the international appeal launched by Toulouse School of Economics and the Climate Economics Chair at Paris Dauphine University who propose setting a universal carbon price and establishing a transcontinental emissions trading system. We hold that the Paris Agreement, which disregarded such recommendations, represents a paradigm shift. The new political economy of climate change departs from the standard approach with regard to its economic instruments (emissions prices and quotas), returning to a classical political economy approach in terms of production economics. It confers a strategic role on methods and techniques for cutting emissions, as part of a long-term vision of energy and industrial transition. It is underpinned by the concerted action of States and multiple actors operating on various scales. There can be no magic wand to swiftly reduce greenhouse gas emissions while disregarding the real conditions of States, which all differ in terms of their relative development, technological capacity and political and social situation, not to mention the diversity of their values and priorities.

Keywords: Paris Agreement, climate change, carbon price, carbon trading, political economy, regulation, decarbonization.

JEL Code: Q54, Q58, F53

1. Introduction

Led by Jean Tirole, winner of the Nobel prize for economics in 2014, the economists of the Toulouse School of Economics have for months been criticising the Paris conference and its foreseeable outcome, dismissing it as ‘media froth’ (Gollier *et al*. 2014), a strategy ‘doomed to fail’ (Gollier, Tirole, 2015), an agreement ‘with no ambition’ (Tirole, Gollier, 2015), or even ‘a summit for nought’ (Thibault, Cherbonnier, 2015).

Paris was not a summit for nought.

According to those who signed the international petition launched by TSE and the Climate Economics Chair at Paris Dauphine University (TSE, CEC, 2015), the decisive solution should have been to set a universal carbon price and establish a transcontinental emissions trading system. The Paris Agreement – its backbone and limitations apparent

for some time – was adopted by consensus on 12 December 2015, disregarding the TSE recommendations. The ink on the agreement was barely dry when Tirole wrote, implicitly recalling the failure of the previous Copenhagen conference in 2009: 'In six years we have made almost no progress' (Tirole, 2015b). We do not endorse this view (Criqui, Damian, 2015). In particular in terms of economic thinking, in which climate-change policy has effected a paradigm shift.

2. No immediate likelihood of a global emissions trading system

The main thrust of the arguments set forth by TSE economists is as follows. Firstly it sets aside what climate experts refer to as 'policies and measures', in other words state action through regulation and standards (which may bear on emissions, products or processes). 'Their application in countries with centrally planned economies has demonstrated their limitations.' (Crampes, Léautier, 2015). Furthermore enforcing standards is 'very expensive'. Rather the accent is placed on an approach based on economic incentives, such as taxation or emissions trading (which the TSE school of thought prefers), all the more so because 'a free market and democracy often go hand-in-hand'.

This scheme is none other than the one advocated during the period between the Kyoto Protocol of 1997 and the failure of the Copenhagen summit in 2009: a three-pronged system based on a global emissions cap, burden-sharing and emissions trading. Appealing in its formal purity, in conformity with the standard economic theory and its supposed virtues in terms of efficacy, fairness and independence, this scheme has nevertheless proved impossible to deploy.

The TSE economists propose two key components to set up a global emissions trading system: first, satellite technology to monitor and measure emissions accurately; and second an independent body to regulate the permit trading system, in other words a price-based mechanism. This body would be tasked with monitoring and measuring national pollution by individual signatories, and penalizing any participants which failed to fulfil their commitments on emissions. It would therefore be a regulatory body, but 'a body protected from any form of influence' (Thibault and Cherbonnier, 2015), like a drone controlled from one knows not where.

'We should, here and now, have sufficient courage,' these authors add, 'to enable the emergence of an independent body capable of seriously monitoring the efforts of each party – satellite technology makes it easy to measure emissions – then agree on firm commitments, even if this means taxing countries which will not accept the rules of the game.' These economists are not familiar with the satellite technology to which they refer, for in practice it is not 'easy' to measure emissions. For the time being satellite metering (though promising) is still difficult, with only limited accuracy. It should be noted that Gollier and Tirole (2015, p. 24) are more cautious and better informed: 'Experimental projects from NASA and ESA to measure the global emission of CO_2 at the country level are promising in the long run.'

In keeping with Gollier and Tirole (2015, p. 27) Thibault and Cherbonnier cite the work of William Nordhaus to support their proposal. The latter has demonstrated 'the viability of this solution, based on forming a club of countries which would agree to impose a carbon tax of €50 per tonne on their population and industry, while imposing a 5% on the others at their border.' But Nordhaus explicitly defines a framework and limitations for his approach: 'The analysis assumes that countries maximize their national economic welfare and ignores partisan, ideological, myopic, and other nonoptimizing behaviors.' He is also careful to emphasize that he has made no allowance for the economic, environmental, legal and diplomatic issues affecting the feasibility of his proposal, wisely leaving this up 'to specialists in those areas' (Nordhaus, 2015, pp. 1341 and 1347-1348). This is just as well.

3. The World Trade Organization cannot, at present, sanction punitive taxes at borders for countries not signing up to a climate agreement

To make a transcontinental emissions trading system operational, the TSE economists have selected two instruments, based on existing bodies. The first is the International Monetary Fund. Failure to comply with a climate agreement would engage the responsibility of a country's future governments and would be treated as sovereign debt augmented by carbon debt. In the case of a mechanism issuing emissions permits, a permit deficit at the end of the year would thus increase national debt. We shall not discuss this point here.

The second party to the system proposed by the authors would be the World Trade Organization, as an incentive to countries hesitating about accepting such an agreement and a means of developing a stable global coalition on climate. The WTO would play a decisive role in their scheme: 'the WTO should view noncompliance with an international agreement as a form of dumping, leading to sanctions. […] one could penalize non-participants through punitive border taxes. This policy would incentivize reluctant countries to jump on board and be conducive to the formation of a stable world climate coalition.' (Gollier and Tirole, 2015, p. 27; also Tirole and Gollier, 2015).

This suggestion is clearly relevant, but it unfortunately disregards the real conditions under which the WTO can act, in other words its capacity to regulate relations between trade and climate. It is consequently purely incantatory and, at least for the time being, wholly inapplicable. This second point requires more ample explanation.

Article 3.5 of the United Nations Framework Convention on Climate Change, signed in 1992, reads: 'Measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.' (United Nations, 1992). Following signature of the Convention, Daniel Bodansky, an eminent authority on global climate change who had attended all the meetings to negotiate and draft the Convention, wrote that Article 3.5 did not, in principle, rule out the possibility of deploying measures at borders (Bodansky, 1993). This may be true, but there are nevertheless entirely objective limitations to imposing such measures.

Out of several hundred multilateral environmental agreements (conventions, treaties and protocols) the climate agreement is, to the best of our knowledge, the only one to suggest not resorting to trade barriers, in other words either controlling or banning imports, or border measures. Yet resorting to measures affecting cross-border trade is a decisive pre-requisite to the effectiveness of major environmental agreements. In particular the 1987 Montreal Protocol strictly regulates international trade in substances that deplete the ozone layer and bans their export.

Does the WTO have a multilateral framework which would authorize it to regulate relations between trade and the environment? Unfortunately this not the case. 'The decision-making bodies of the WTO (the General Council, the Ministerial Meetings, and the Dispute Settlement Body) try hard to keep trade and the environment in watertight compartments: the WTO has so far declined to endogenize the relationship between the biosphere and international trade. These bodies do not pronounce on the content of the environmental rules which all manner of institutions (public, private and hybrid) have set up, outside the WTO. So far as they are concerned, the issue is merely one of the compatibility of these regulations with the basic principles of the multilateral trading system: market access and non-discrimination.' (Damian, Graz, 2001b, p. 598; also 2001a, pp. 1-9)

The WTO has no say on matters related to the environment, nor yet on food, health or technical standards. It leaves this up to other bodies, in particular the Food and Agriculture Organization (FAO) and the World Health Organization (WHO), and other agreements, such as the Technical Barriers to Trade (TBT) agreement, or the one on Sanitary and Phytosanitary (SPS) measures, as well as the Multilateral Environmental Agreements. The WTO restricts itself to recognizing and using standards approved by States as part of multilateral negotiations in other assemblies. Its position, clearly set forth on its website, has not changed since its inception in 1995: 'The issue of climate change, per se, is not part of the WTO's ongoing work programme and there are no WTO rules specific to climate change. However, the WTO is relevant because climate change measures and policies intersect with international trade in a number of different ways.'

The UNFCC would have to be redrafted or a protocol appended to the existing agreement in order to authorize border measures such as levying customs duty at borders. But is this conceivable? As climate talks stand, in the wake of the Paris agreement which leaves it up to sovereign States to take the necessary measures, it seems highly unlikely.

The Group of 77 (G77) and large emerging economies belonging to the Basic group (Brazil, South Africa, India and China) are against any attempt to impose 'unilateral measures, including fiscal and non-fiscal border measures' against imported goods in an effort to cut emissions. This was the case on the eve of the Copenhagen Conference in 2009, when the Basic group was formed (Barrett, 2010, p. 20). Since then the position of emerging and developing countries has not changed at all. They remain firmly opposed to border measures.

This is the stumbling block for the mechanism proposed by Gollier and Tirole. Nor is there any cause for celebration at this glaring shortcoming in the multilateral system. Contrary to what Tirole advocates, the WTO is not currently in a position to authorize punitive border taxes for countries not signing up to an international climate agreement.

4. The American model for sulphur dioxide permits: an empty shell

For many years the American sulphur dioxide allowance trading system, launched in 1990, served as an argument in favour of and a model for establishing a CO_2 emissions trading system. But the SO_2 system has turned out to be an empty shell, for reasons we shall not explain here (Burtraw, 2012; Ellerman, 2012; Schmalensee, Stavins, 2013; Damian, 2014). In 2009, thinking ahead to the Copenhagen Conference, Tirole suggested that States should undertake to set up a global CO_2 emissions trading system. At several points in his paper he cited the exemplary nature of the US SO_2 trading system (Tirole, 2009). Tirole and other advocates of carbon trading have said little about the confusion into which the US system has sunk.

To address the matter seriously they would have to acknowledge that Europe has done just as well, or perhaps better, with its regulatory policies. This is particularly true of Germany where the success of the programme to cut SO_2 emissions is primarily due to the strength of the institutional and political signal, in other words the pressure of public opinion on the authorities and the operators of electric power plants. Regulation of SO_2 emissions by large coal-fired power plants started in July 1983. Emissions were reduced by a factor of almost 10 between 1983 and 1990. There is no doubt whatsoever that this approach is more effective than market incentives: 'Traditional economists' view is that command-and-control instruments are less efficient than economic instruments (e.g., taxes and tradable permits) […] However, our analysis suggests that the German command-and-control approach was most likely the best choice in terms of efficiency […] The implementation of an SO_2 emissions trading scheme in the United States has not led to the development of technologies that could have been used to achieve the ambitious German reduction aims at lower costs.' (Wätzold, 2004, pp. 37 and 38).

5. Cause for optimism in the Chinese emissions market?

'Economics, much as good sense,' according to Claude Crampes and Thomas-Olivier Léautier (2015), 'suggests that the most effective means of cutting greenhouse gas emissions is to increase their price. For a change the Chinese Communist party endorses our view and has recently proposed setting up a carbon emissions trading system in China.' On 24 September 2015, during a visit to the White House in Washington, President Xi Jinping announced that a system of this sort would be rolled out for the whole of the People's Republic in 2017.

However the specialists assert that it will be a long time before this market becomes the main instrument of China's climate policy. Rather the announcement was primarily intended as a signal for the imminent Paris Conference. The project would only start in 2017, setting upper limits for the branches of industry generating the most emissions, apart from transport.

There is every reason to assert that China's *political* regime is particularly well placed to set up an effective, efficient and increasingly strict carbon-trading system. We should however also bear in mind the words of Qi Ye, the director of the Climate Policy Institute of Tsinghua University in Beijing and the Brookings-Tsinghua Centre: 'Europe certainly is a market system, so if Europe cannot do an emissions trading system well, how would you expect China to have a successful carbon market?' (quoted by Buckley, 2015). But this position perhaps only reflects Mr Qi's broader caution regarding the tendency to underestimate constraints entailed by decarbonization: 'To translate the optimism into green and low-carbon development requires a lot of hard work — harder perhaps than many may realize.' (Qi Ye, Tong Wu, 2015).

6. Policies will stay national for years to come

The TSE economists' approach to climate change seems to have little to do with the human condition. The policy they advocate is not rooted in the societies supposed to implement it; their policy floats in the air, driven by an emissions trading system suspended from and controlled by observation satellites and an administrative drone.

In stark contrast, the Paris Agreement is important and challenging because, for decades to come, it will relate to stakes with a firm, territorial basis, close to the conditions under which people live, to their way of life and behaviour. Because, in the main, the political, material and ecological conditions governing human life and livelihoods are not framed at an international level, or as part of some 'over-arching' independent body.

The Paris Agreement marks a turning point. Its ambitions are undoubtedly modest, falling far short of what would be needed to swiftly reduce greenhouse gas emissions and enable global warming to remain below the 2°C target set by the UN, even if States have set a political goal of limiting the rise in temperature to 1.5°C. Multilateral tensions and the acrimony of poor countries with regard to their rich counterparts will not vanish, weighing on future summits and urgently needed action. For years to come the agreement will be exposed to the claims of developing countries with regard to funding for mitigation and adaptation policies, and, for the most vulnerable among their number, to compensation for the irreparable damage they are already enduring (Damian, 2015a).

In any case it is too late – a point which attracted far too little attention at the Paris Conference – to halt climate change which has already started and the damage it inevitably entails: 'Most aspects of climate change,' as IPCC scientists wrote in the 5th and latest report, 'will persist for many centuries *even if emissions of CO2 are stopped*.' (IPCC, 2013, p. 27, our emphasis).

7. Putting a price on carbon, but how?

On the issue of carbon pricing Tirole repeated, three days after the agreement was signed, that: 'What is needed is a universal price for carbon compatible with the target

of 1.5°C or 2°C' (Tirole, 2015a). His colleagues at the TSE may endorse this imperative, but is it credible at a global level? Statements of this type, even underpinned by the relevance and rigour of a Nobel prize winner, have never survived confrontation with the harsh realities of world politics and the economy.

Tirole added: 'The wait-and-see strategy of intended nationally determined contributions has prevailed.' What other strategy is there than one open to the action of States, all of which differ in terms of their relative development, technological capacity and political and social situation, not to mention the diversity of their values and priorities? There is no magic wand to swiftly reduce greenhouse gas emissions while disregarding these realities.

By the end of the conference any idea of a worldwide levy on carbon seemed remote. Paragraph 137 of the (neither binding nor monitored) decisions taken by the conference – and not cited by the Agreement itself – briefly mentions 'carbon pricing' for the first time in a document produced by a Conference of the Parties. It sketches out a long pathway requiring individual countries to set national carbon prices, which it is hoped will gradually converge in the long term, perhaps initially within the framework of clubs formed by groups of countries (Espagne, 2015), possibly joined by large firms and other actors such as regional and metropolitan governments. Here again, this will entail battles at an international level and inside individual countries.

8. A new political economy of climate change

The new political economy of climate change mapped out by the Paris Agreement only departs from the standard approach with regard to its economic instruments (emissions prices and quotas), returning to a classical political economy approach in terms of production economics (Damian, 2015b, pp. 83-94; Damian, Vivien, 2015). It confers a strategic role on methods and techniques for cutting emissions, as part of a long-term vision of energy and industrial transition. It is underpinned by the concerted action of States and multiple actors operating on various scales.

The Deep Decarbonization project – the most striking economic study presented at COP21, on 11 December, at the French Pavilion at Le Bourget – is testimony to this paradigm shift (IDDRI, 2015; Damian, 2014), moving from a top-down to a bottom-up approach. The study was instigated in 2013 by French Foreign Minister Laurent Fabius and coordinated by France's Institut du Développement Durable et des Relations Internationales, headed at the time by Laurence Tubiana, and the UN's Sustainable Development Solutions Network, led by Jeffrey Sachs. It focuses on long-term national decarbonization pathways for the biggest sources of greenhouse gas emissions (Ribera, Sachs, 2015).

The Deep Decarbonization study brings together work on energy-transition scenarios by 16 national teams, painting a long-term picture of possible decarbonized futures, for use by the governments of the relevant countries. Its approach is original in that it makes allowance for the specificities of each country: potential of technologies deployed, acceptability of various options, such as nuclear power, inertia of urban and transport

infrastructure inventory, development stakes such as inequality and poverty, job market, local pollution and public health.

It is a pity that France and the European Union had so little say in the basic rules and limited pledges of the INDCs, though it in no way detracts from the work done organizing the conference and building final agreement. Bodansky was full of praise for France's achievement: 'Paris is definitely one of the best-organized COPs ever – the French have done a fantastic job.' (Bodansky, 2015). The emissions-reduction targets set by the agreement will need to be raised, from 2025 onwards at the latest and particularly for the INDCs, but it is nevertheless here to stay, certainly for the rest of this century.

9. Conclusion

French President François Hollande, in his speech opening the Business Climate Summit on 20 May 2015, quite rightly emphasized the long-term perspective: 'What is also at stake at Paris is the transformation of the world, either because we shall have failed to achieve agreement, in which case we shall be left on a planet where it will be increasingly difficult to survive […] Or we shall reach agreement, in which case a revolution will be underway, in the way we produce, transport, consume, develop, and ultimately in the way we live.' (Elysée, 2015).

This is a huge undertaking which, for the whole of the century, will have to surmount turbulent changes reaching far beyond just the climate.

There will be no shortage of tension between blocks of nations, nor yet of despair among increasingly vulnerable communities, of fierce competition between firms and conflict focusing on production, labour and transfer. As we well know decarbonization will be a long hard struggle

The next climate conference (COP22) will be held in Marrakesh in December 2016, in Africa where part of the future of humankind will be decided, with many challenges for the continent as a whole, individual nations and regions. It is a fair assumption that neither a universal carbon price nor yet a transcontinental trading system will rank very high on the agenda.

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